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DISCLOSURE TITLE: Wake on Access from Cable Modem

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DISCLOSURE TEXT:

Problem Solved By This Invention: Cable modem technology is rapidly penetrating US households. Cable modems offer the key benefit of constant connectivity. Because cable modems use connection-less technology, much like an office LAN, a subscriber's PC is always on-line with the network. The only problem is the subscriber's PC is not always turned on. This invention will add a defined protocol that, when transmitted to the subscriber's PC, will power up the PC to receive the packets from the network. Description of Invention: Cable systems were originally designed to deliver broadcast television signals efficiently to subscribers' homes. To ensure that consumers could obtain cable service with the same TV sets they use to receive over-the-air broadcast TV signals, cable operators recreate a portion of the over-the-air radio frequency (RF) spectrum within a sealed coaxial cable line. Traditional coaxial cable systems typically operate with 330 MHz or 450 MHz of capacity, whereas modern hybrid fiber/coax (HFC) systems are expanded to 750 MHz or more. Logically, downstream video programming signals begin around 50 MHz, the equivalent of channel 2 for over-the-air television signals. The 5 MHz - 42 MHz portion of the spectrum is usually reserved for upstream communications from subscribers' homes.

Each standard television channel occupies 6 MHz of RF spectrum. Thus a traditional cable system with 400 MHz of downstream bandwidth can carry the equivalent of 60 analog TV channels and a modern HFC system with 700 MHz of downstream bandwidth has the capacity for some 110 channels. Cable Modem Access Networks To deliver data services over a cable network, one television channel (in the 50 - 750 MHz range) is typically allocated for downstream traffic to homes and another channel (in the 5 - 42 MHz band) is used to carry upstream signals.

A cable modem headend system communicates through these channels with cable modems located in subscriber homes to create a virtual local area network (LAN) connection. Most cable modems are external devices that connect to a personal computer (PC) through a standard 10 Base-T Ethernet card and twisted-pair wiring. The cable modem access network operates at Layer 1 (physical) and Layer 2 (media access control/logical link control) of the Open System Interconnect (OSI) Reference Model. Thus, Layer 3 (network) protocols, such as IP traffic, can be seamlessly delivered over the cable modem platform to end users.

A single downstream 6 MHz television channel may support up to 27 Mbps of downstream data throughput from the cable headend using 64 QAM (quadrature amplitude modulation) transmission technology. Speeds can be boosted to 36 Mbps using 256 QAM. Upstream channels may deliver 500 Kbps to 10 Mbps from homes using 16QAM or QPSK (quadrature phase shift key) modulation techniques, depending on the amount of spectrum allocated for service. This upstream and downstream bandwidth is shared by the active data subscribers connected to a

given cable network segment, typically 500 to 5,000 homes on a modern HFC network. Each cable modem has an unique address. The Wake On Access frame will contain the unique address repeated 16 times.

After that it will have a command packet. The command packet supports multiple actions to the computer including turn on, turn off, and others. The cable modem will have aux power from the power line and the ability to always look at the downstream TV channel which supports the cable modem data. When it sees it's MAC address repeated 16 times it will send a signal to the personal computer to turn on the personal computer power supply and bring the computer up to full operation. There are many examples where this will be beneficial to end users. An example is an end user wants to get the Wall Street Journal. The Wall Street Journal can be transmitted at 36 Mbps within a few minutes. The entire Journal would then be stored on the end user hard drive. The problem is you need to ensure the computer is ON to accept the digital Journal for storage on the hard drive. With this invention you would send the Wake on Cable packet first. This would wake up the computer so it would be ready to receive the full Journal. Once the Journal is sent another packet similar to the Wake up packet can turn it off.

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